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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,967	01/02/2004	Qi Yu	USP2141A-BDP	9684

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EXAMINER	
BOWERS, NATHAN ANDREW	

ART UNIT	PAPER NUMBER
1744	

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/749,967	YU, QI	
	Examiner	Art Unit	
	Nathan A. Bowers	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "a far infrared ray emitter comprising ceramic powders mixing with said nano titanium oxide to integrally provide at said liquid container..." does not indicate how or in what way the ceramic powder and titanium oxide mixture is integrally formed at the liquid container. The phrase is uses process language in an apparatus claim, and is not grammatically clear.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1) Claims 21, 23, 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koo (US 5234985) in view of Wey (US 20050061157) and Mager (US 6790273).

Koo discloses a transparent resin composition that is formed by mixing a raw plastic material with far infrared ray emitting ceramic powders. This is disclosed in column 1, line 40 to column 2, line 54. Column 3, lines 23-26 indicate that the plastic/ceramic mixture is used to form the walls of a food container. The emitted far infrared rays intrinsically must work to

reduce germ contamination, as this feature of far infrared rays is well known in the art. Koo, however, does not disclose specific physical features (bottle or cap) of the food container to be constructed from the transparent resin composition, or that nano titanium oxide particles are mixed with the ceramic far infrared ray emitting particles.

Wey discloses an adhesive sticker that can be attached to a beverage serving means. Paragraph [0032] states that the sticker contains a far infrared ray emitting material (Figure 1:11) comprised of a ceramic powder. The sticker is intended to be attached to a water bottle, as shown in Figure 3. Paragraph [0033] teaches that self-adhesive infrared radiating device can be placed on any beverage serving means. It is an intrinsic feature of this invention that the sticker may be placed on the cap portion of a plastic bottle containing a detachably sealing cap (Figure 3 illustrates a bottle with a lid), as plastic bottles in combination with lids is well known. Paragraph [0035] states that transition metal oxides, such as titanium oxide, are added to the ceramic powder.

Mager discloses a coating containing ultraviolet light absorbers for the long-term protection of plastic materials. In column 2, lines 51-58 and throughout the reference, Mager teaches that nano cerium oxide particles may be integrated into various polymers to form coatings that are capable of protecting objects from photochemical degradation. In column 1, lines 35-39, Mager discloses that titanium oxides have the same advantages as cerium oxides, in that they are effective UV absorbers and are not leached out or discharged under thermal loads.

Wey, Koo and Mager are analogous art because they are from the same field of endeavor regarding the formation of films to be applied to plastic containers.

At the time of the invention, it would have been obvious to use the far infrared emitting ceramic/plastic composition disclosed by Koo to form a bottle with a detachable cap. Wey teaches that plastic bottles containing beverages would benefit from the addition of far infrared emitting ceramics since the infrared rays would serve to preserve, energize, and enhance the taste of the liquid inside. Far infrared rays are also well known in the art as a germ decontamination means. It would have also been obvious to mix nano titanium oxide particles into the plastic composition in order to give the formed plastic bottle UV absorbing properties. In column 7, lines 6-30, Mager teaches that nano metal oxide coatings provide long-term protection from radiation, are highly transparent, and therefore are good to use in conjunction with plastic containers.

2) Claims 22, 25, 26, 27, 30, 33, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koo (US 5234985) in view of Wey (US 20050061157 A1) and Mager (6790273 B2) as applied to claims 21, 23, 29 and 31, and further in view of Watanabe (US 6296943 B1).

Koo, Wey and Mager disclose the apparatus and method set forth in claims 21, 23, 29 and 31as set forth in the 35 U.S.C. 103 rejection above. In addition, Mager teaches in column 7, lines 6-30 that the plastic material can be used to coat the wall of a substrate, rather than directly forming the wall of the substrate, as taught by Koo. Koo, Wey and Mager, however, do not expressly disclose that the protective arrangement is an aqueous coating comprising 5% far infrared ray emitter and nano titanium oxide by weight and 95% water by weight.

Watanabe discloses that a method for producing a titanium oxide composite sol that may be applied as a coating to plastics, glass, and ceramics. In column 5, lines 38-39 and column 14, line 65 to column 15, line 62, Watanabe states that titanium oxide particles 2-20 nm in size are used in making the coating, and that other metal oxides may be incorporated in order to insure that the coating is capable of blocking UV rays without resulting in a color change. Column 23, line 38 to column 24, line 17 teaches a method for manufacturing the coating in which an aqueous coating containing around 5% titanium oxide by weight is formed (step b-d). Routine experimentation would allow for one of ordinary skill in the art to determine an optimum titanium oxide weight percentage. Although Watanabe goes on the state that the water is substituted by methanol to form the finished coating (step e), this step is not essential for the formation of a functional coating. Watanabe's product that is around 5% by weight titanium oxide and the majority water, and a coating that is 5% titanium oxide and 95% water are not identical, but are similar in that that one of ordinary skill in the art would have expected them to have the same properties, according to *Titanium Metals Corp. of America v. Banner,* 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Koo, Wey, Mager, and Watanabe are analogous art because they are from the same field of endeavor regarding the formation of plastic resins containing additives.

At the time of the invention, it would have been obvious to produce a coating containing the nano titanium oxide and infrared emitting ceramics disclosed by Koo, Wey and Mager. Mager teaches in column 1, lines 35-39 that titanium oxide UV absorbers are effectively incorporated into plastic coatings since they are not leached out or discharged under thermal loads. Watanabe states in column 7, lines 4-10 that coatings comprising 5% by weight infrared

emitter and nano titanium oxide constituted and 95% water are effective because coatings containing a smaller concentration of "active components" are poor in efficiency and uneconomical, whereas coatings containing higher concentrations are undesirable because the viscosity of the coating becomes too large. Furthermore, coatings containing higher amounts of titanium oxide and infrared emitter are unlikely to experience significant increases in germ inhibition and UV protection.

3) Claims 24, 28, 32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koo (US 5234985) in view of Wey (US 20050061157 A1), Mager (6790273 B2) and Watanabe (US 6296943 B1) as applied to claims 23, 24, 31 and 32, and further in view of Andrews (US 20050171253 A1).

Koo, Wey, Mager and Watanabe disclose the apparatus and method set forth in claims 23, 24, 31 and 32 as set forth in the 35 U.S.C. 103 rejection above, however do not expressly disclose that the infrared ray emitter and nano titanium oxide are in a 1:10,000 weight ratio with the plastic material of the liquid container.

Andrews discloses a method for forming plastic containers that are comprised of various ultraviolet-absorbing moieties in order to protect foodstuffs and beverages from the deleterious effects of UV radiation. The UV absorbers are integrally mixed with the plastic material to integrally form the container body. This is disclosed in paragraph [0001] and paragraphs [0024] through [0028]. Although Andrews specifically teaches that hydroxyphenylbenzotriazole molecules are used as UV absorbers, it is taught in paragraph [0249] that titanium oxide still may

be incorporated into the plastic material of the container. In paragraph [0202], it is disclosed that the added UV blockers are in a 1:10,000 weight ratio (0.01%) with plastic container material.

Koo, Wey, Mager, Watanabe and Andrews are analogous art because they are from the same field of endeavor regarding the addition of far infrared ray emitting and/or UV absorbing compounds to plastic containers.

At the time of the invention, it would have been obvious to integrally mix the titanium oxide and infrared emitting powder protective arrangement disclosed by Koo, Wey, Mager, and Watanabe with the plastic material of the container body in order to form a product with a desirable additive to raw plastic material ratio. It would have been apparent to add the titanium oxide and infrared ray emitter protective arrangement mix at the same 1:10,000 weight ratio disclosed by Andrews, especially since his UV absorbers and the protective arrangement mixture disclosed by Wey and Mager essentially perform identical tasks by preventing excess ultraviolet light from entering the plastic container. This concentration is beneficial because it provides for UV blocking and infrared emitting compounds scattered throughout the plastic in an amount that is high enough to be effective. Furthermore, the concentration is not so high that it is still possible to attain significant increases in performance corresponding to increases in concentration, because the plastic is not saturated with additives.

Response to Arguments

Applicant's arguments, see pages 5-10, filed 24 January 2006, with respect to the rejection(s) of claim(s) 1-20 under 35 U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Koo, Wey, Mager, Watanabe and Andrews.

Applicant's principle arguments are

(a); (b); (g) Applicant has added new claims to further clarify that a protective arrangement is integrally formed on a container with a cap. None of the submitted prior art discloses that the container body is formed by mixing the protective arrangement with a raw plastic material. Wey simply states that a protective arrangement is attached to the container body as a sticker, and not integrally formed thereon.

In response to Applicant's arguments, please consider the following comments.

A new rejection has been made with Koo serving as the principle prior art. Koo discloses a transparent resin composition that is formed by mixing a raw plastic material with far infrared ray emitting ceramic powders. This is disclosed in column 1, line 40 to column 2, line 54. Column 3, lines 23-26 indicate that the plastic/ceramic mixture is used to form the walls of a food container. Koo is modified by Wey, who indicates that it is desirable to use far infrared emitting ceramic powders in conjunction with plastic water bottles with caps.

(c); (d) Applicant asserts that the submitted prior art fails to teach that ceramic powders are mixed with nano titanium oxide particles designed to block UV radiation. There is no stated motivation in the submitted prior art which suggests adding nano titanium particles to a plastic material containing ceramic additives.

In response to Applicant's arguments, please consider the following comments.

Koo and Wey are combined with Mager in order to indicate that it would have been obvious to construct the body of a plastic bottle from a plastic made with ceramic powder and nano titanium oxide particles. Koo teaches that it is well known in the art to make plastics comprising ceramic powders that emit far infrared rays. Mager teaches that it is well known in

the art to make plastics comprising nano titanium oxide particles. Therefore, it would have been obvious to construct the body of a plastic container from a resin comprising both ceramic powder and nano titanium oxide particles. Mager teaches in column 7, lines 6-30 that the infusion of nano titanium oxide particles would have been beneficial because it would have given the formed plastic bottle UV absorbing properties. Mager teaches that nano metal oxide coatings provide long-term protection from radiation, are highly transparent, and therefore are good to use in conjunction with plastic containers. It is true that the focus of Mager's invention involves cerium oxide UV blockers, however Mager states in column 1, lines 35-39 that titanium oxide and cerium oxide exhibit similar qualities and may be used to in the same types of applications.

(e); (f) Applicant asserts that the submitted prior art fails to teach that the protective arrangement can be mixed to form a film that is coated upon the exterior surface of a container body and cap. There is no motivation to use the resin disclosed by Koo, Wey and Mager as a coating.

In response to Applicant's arguments, please consider the following comments.

Both Mager and Watanabe teach that plastic materials can be used to coat the wall of a substrate, rather than directly forming the wall of the substrate, as taught by Koo. The use of coatings is beneficial because they can be applied to a variety of different substrates. In this way, containers made from materials other than plastic, like glass, can benefit from the addition of far infrared emitting ceramics and UV blocking titanium oxide particles.

(h); (i) Applicant states that the prior art does not disclose the formation of plastics comprising a 1:10,000 weight ratio of far infrared ray emitter and nano titanium oxides to raw

material. A protective arrangement composition of 5% ceramic and titanium oxide and 95% water is not disclosed.

In response to Applicant's arguments, please consider the following comments.

Watanabe discloses that a method for producing a titanium oxide composite sol that may be applied as a coating to plastics, glass, and ceramics. In column 5, lines 38-39 and column 14, line 65 to column 15, line 62, Watanabe states that titanium oxide particles 2-20 nm in size are used in making the coating, and that other metal oxides may be incorporated in order to insure that the coating is capable of blocking UV rays without resulting in a color change. Column 23, line 38 to column 24, line 17 teaches a method for manufacturing the coating in which an aqueous coating containing around 5% titanium oxide by weight is formed (step b-d).

Andrews discloses a method for forming plastic containers that are comprised of various ultraviolet-absorbing moieties in order to protect foodstuffs and beverages from the deleterious effects of UV radiation. The UV absorbers are integrally mixed with the plastic material to integrally form the container body. This is disclosed in paragraph [0001] and paragraphs [0024] through [0028]. Although Andrews specifically teaches that hydroxyphenylbenzotriazole molecules are used as UV absorbers, it is taught in paragraph [0249] that titanium oxide still may be incorporated into the plastic material of the container. In paragraph [0202], it is disclosed that the added UV blockers are in a 1:10,000 weight ratio (0.01%) with plastic container material.

Routine experimentation would allow for one of ordinary skill in the art to determine optimum weight ratios for the formation of the plastic resins, and optimum weight percentages for the formation protective arrangements to impregnate into the plastic resins. The claimed weight ratios and weight percentages are simply result effective variables. In the absence of new

or unexpected results, it would have been obvious to optimize the composition of the protective arrangement of ceramic powder and titanium oxide particles, as well as to optimize the composition of the plastic resin which can either directly form the walls of a container or be coated upon the container. This optimization could simply be accomplished by producing different compositions and testing their efficiency in reducing germs and absorbing UV light. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Bowers whose telephone number is (571) 272-8613. The examiner can normally be reached on Monday-Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2/8/06

NAB

KRISANNE JASTRZAB
PRIMARY EXAMINER